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# Two new species of *Graphidaceae* (lichenized *Ascomycota*) from Brazil

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**Abstract** – *Phaeographis flavescens* and *Thalloloma pontalense* are described as new species. These species were found growing in restinga in Southern Brazil.

**Key words** – lichenized fungi, lichens, *Ostropales*, Paraná

## Introduction

The family *Graphidaceae* Dumort. contains about 1000 species and is an important component of the lichen biota in tropical and subtropical regions (Staiger et al. 2006). During a survey of *Graphidaceae* in Paraná State, Southern Brazil, one new species of *Phaeographis* and one new species of *Thalloloma*, both with stictic acid, were encountered.

*Phaeographis* Müll. Arg. is a genus characterized by brown ascospores reacting I+ wine-red, generally inspersed hymenia, poorly developed and uncarbonized excipula and lirellae with exposed discs (Staiger 2002, Archer 2006, Cáceres 2007, Lücking & Rivas-Plata 2008).

*Thalloloma* Trevis. is characterized mainly by the ecorticate thallus and lirellae with brown or red exposed discs, hyaline ascospores reacting I+ violet, uncarbonized excipula and clear hymenia (Staiger 2002, Archer 2006, Cáceres 2007, Lücking & Rivas-Plata 2008).

The new species are described and illustrated below.

## Materials and methods

The new species were described from specimens collected in a typical Brazilian coastal vegetation forest, known as restinga, in Paraná State, Southern Brazil. The

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specimens were examined using standard stereoscopic and light microscopic techniques. Sections of thalli and ascomata were mounted in water, 10% KOH and Lugol's Solution. All measurements were made in water. Chemical constituents were identified by thin layer chromatography (Culberson & Ammann 1979, Elix & Ernst-Russell 1993) and by comparison with authentic samples.

## Taxonomy

***Phaeographis flavescens*** Dal-Forno & Eliasaro, **sp. nov.** Fig. 1

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*Simile* Phaeographis intricans *sed acidum sticticum continente differt.*

Type: **BRAZIL**. **Paraná**: **Pontal do Paraná**. Pontal do Sul, 28.II.2008, S25°34'11.1" W48°21'32.4", M. Dal-Forno 433 (**Holotype**–UPCB).

Etymology: The specific epithet is derived from the Latin *flavus*, and it refers to the yellow color of the thallus after the application of potassium hydroxide solution.

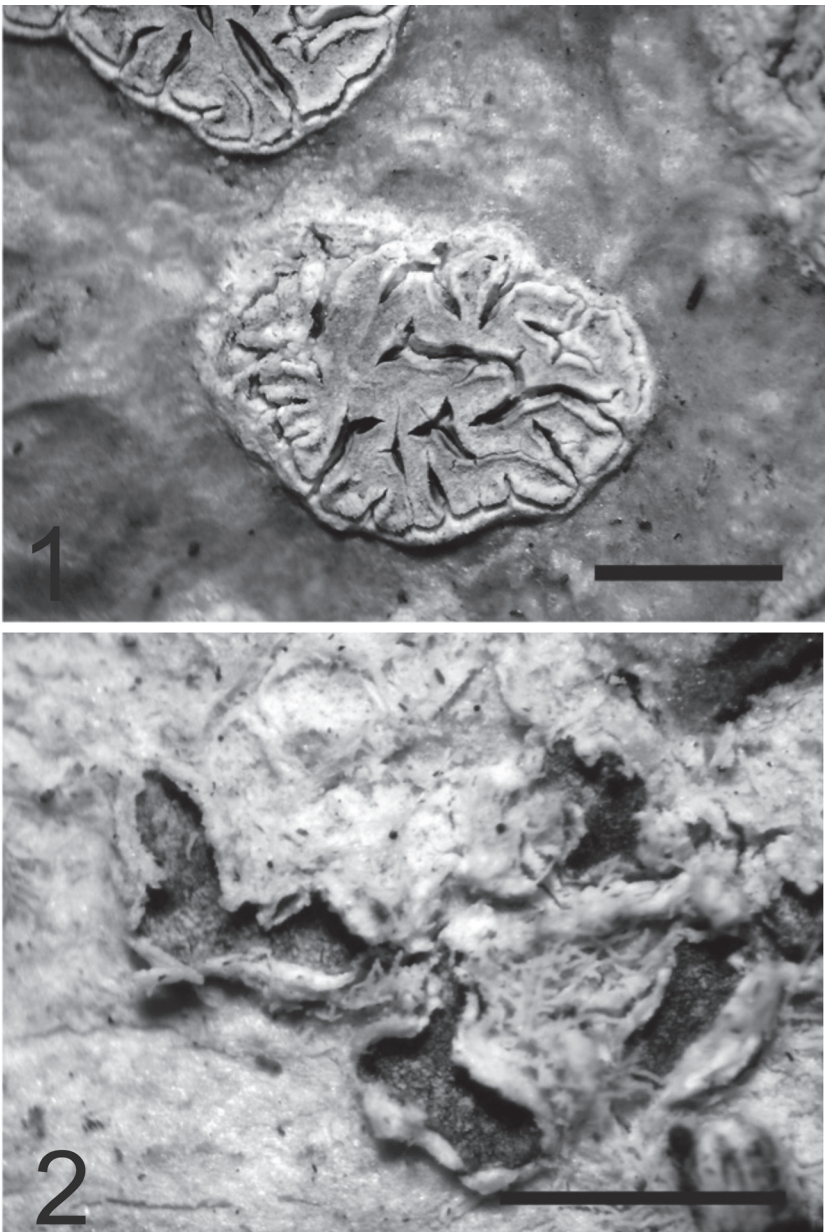
Thallus corticolous, epiperidermal, continuous, 130–140 µm thick, with crystals; surface green to yellowish green, dull, smooth; corticate. Ascomata lirelliform, immersed in pseudostromata, flexuose, branched, 0.3–2.0 mm long, 0.2–0.3 mm wide, with small lateral cracks; disc exposed, grey with white pruina; pseudostromata conspicuous, pale yellow, distinctly raised from the thallus, 150–200 µm high, with crystals; labia entire; excipulum uncarbonized, 85–125 µm high, laterally rudimentary, base well developed, yellow, 25 µm high. Hymenium clear, 60–100 µm high, 125–175 µm wide, I–; paraphyses unbranched but with branched tips, filiform, 1.0–1.5 µm thick, hyaline, with brown tips; ascospores 8 per ascus, brown, I+ wine-red, ellipsoid, transversely (3–)5-septate, 21–25 × 6–7 µm.

Chemistry: thallus K+ yellow, stictic acid and other stictic acid satellites present.

Additional specimens examined – **BRAZIL**. **Paraná**: **Pontal do Paraná**. Pontal do Sul, 28.II.2008, S25°34'11.1" W48°21'32.4" M. Dal-Forno 336, 346, 371, 377 (UPCB).

Comments – *Phaeographis flavescens* is characterized by immersed lirellae in a pale yellow prominent pseudostroma, with greyish white pruinose discs, an uncarbonized excipulum, a clear hymenium, brown, small and transversely 5-septate ascospores, and the presence of stictic acid and other related compounds.

This species is very similar to species in *Sarcographa* Fée, suggested by the formation of well defined stromatic clusters, conspicuously raised from the thallus, and by the chemistry. In addition, *Phaeographis flavescens* possesses small slits in the margins of the lirellae, which could be confused with the characteristic transverse fissures of *Sarcographa*. Despite these characteristics,




Figures 1–2: New species of *Graphidaceae* from Brazil. 1: *Phaeographis flavescens* (holotype, UPCB); 2: *Thalloloma pontalense* (holotype, UPCB); bars = 1 mm.

the brown ascospores reacting I+ wine-red, lirellae with exposed discs and the clear hymenia place the new species in the genus *Phaeographis*. The absence of carbonization in the exciple excludes the possibility of the new species being a species of *Sarcographa* or other related genus.

*Sarcographa cuyabensis* Redinger is very similar to *P. flavescens*, differing by the slightly smaller ascospores, (12–)15–18 µm long, and the indistinct pseudostroma (Redinger 1933).

*Phaeographis intricans* (Nyl.) Staiger closely resembles *P. flavescens*, differing only in the lichen compounds present: norstictic acid in *P. intricans* (Nylander 1863, Staiger 2002) and stictic acid and related compounds in *P. flavescens*.

***Thalloloma pontalense*** Dal-Forno & Eliasaro, **sp. nov.** Fig. 2

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*Simile* Thalloloma anguinum *sed lirrelas latiores et acidum sticticum continente differt.*

Type: **BRAZIL**. **Paraná**: **Pontal do Paraná**. Pontal do Sul, 28.II.2008, S25°34'02.2" W48°22'01.8", M. Dal-Forno 592 (**Holotype**-UPCB).

Etymology: The specific epithet is derived from the type locality, Pontal do Sul, Southern Brazil.

Thallus corticolous, epiperidermal, continuous, 40–70 µm high, with crystals; surface whitish pale grey, dull, smooth; corticate. Ascomata lirelliform, flexuose, unbranched to branched, immersed to erumpent, 0.8–1.0 mm long, 0.3–0.4 mm wide; disco exposed, pale brown pruinose; thalline margin laterally present, conspicuous, 200–225 µm high, 45–50 µm thick, extending beyond the hymenium and excipulum; labia entire; excipulum uncarbonized, 75–100 µm high, rudimentary. Hymenium clear, 75–100 µm high, 220–230 µm wide, I–; paraphyses branched and anastomosing, filiform, 1.0 µm thick, hyaline, with brown tips; ascospores 8 per ascus, hyaline to slightly brownish, I+ violet-blue, ellipsoid, muriform, 11–13 × 3–4-locular, 45–55 × 14–15 µm.

Chemistry: thallus K+ yellow, stictic acid present.

Additional specimens examined – **BRAZIL**. **Paraná**: **Pontal do Paraná**. Pontal do Sul, 28.II.2008, S25°34'02.2" W48°22'01.8" M. Dal-Forno 581 (UPCB).

Comments – *Thalloloma pontalense* is characterized by the oblong to slightly elongated ascomata, not showing the typical shape of a lirella, with exposed, brown pruinose discs, muriform ascospores with 40–50 µm and presence of stictic acid.

Stictic acid is one of the most common lichen compounds found in the *Graphidaceae* (Staiger 2002) but it is uncommon in the genus *Thalloloma*. It occurs in *T. patulum* (A.W. Archer) A.W. Archer from the Solomon Islands (Archer 2007).

*Thalloloma pontalense* is very similar to *T. anguinum* (Mont.) Trevis., but differs in the shape of the lirellae, which are not very elongated, the presence of stictic acid, and the absence of lichexanthone. *Thalloloma pontalense* also has much wider ascomata, being 0.3–0.4 mm wide, whereas *T. anguinum* has lirellae 0.15–0.2 mm wide, exactly half the width, which in *Graphidaceae* is a significant difference. In addition, *Thalloloma pontalense* has a conspicuous thalline margin, extending 100 µm above the hymenium, whereas the thalline margin in *T. anguinum* is only present laterally, not extending beyond the level of the hymenium and excipulum.

*Thalloloma pontalense* is morphologically similar to a species found in Costa Rica, namely "*Thalloloma chroodiscoides*" (Sipman 2008). However, the later species has smaller ascospores, up to 26 µm long, and it lacks lichen compounds.

*Thalloloma deplanatum* (Nyl.) Staiger is also similar to *T. pontalense*, showing the same shape of ascomata and size of ascospores, but in *T. deplanatum* the thalline margin is less conspicuous, the excipulum has a double margin and the ascospores have only transverse septa.

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